DIGITAL INNOVATION FOR CULTURAL DIPLOMACY: ARTIFICIAL INTELLIGENCE, CYBERSECURITY AND MENTORSHIP IN THE BALKAN REGION

Doina Banciu [1], Monica Barbu[1,2]
[1] Academy of Romanian Scientists - AOSR, ORCID No. 0009-0002-5109-1283, doina.banciu@aosr.ro
[2] National Institute for Research and Development in Informatics – ICI Bucharest, Corresponding author, ORCID No.0000-0002-5134-794X, monica.barbu@ici.ro

ABSTRACT: This paper investigates the role of digital innovation in advancing cultural diplomacy and female leadership in the Balkan region. It presents the conceptual framework for a platform entitled Professional Connections for Women in the Balkans, which integrates artificial intelligence (AI), cybersecurity principles, and mentorship programs. By combining modular machine learning models with conversational AI tools, the platform is envisioned to provide personalized services, enhance user engagement, and foster collaboration across borders. The expected outcomes include the creation of a secure and scalable digital ecosystem that amplifies women's voices, strengthens regional leadership, and promotes cultural diplomacy as a driver of social transformation.

KEYWORDS: artificial intelligence; digital innovation; cultural diplomacy; science diplomacy; mentorship; Balkan region

DOI 10.56082/annalsarscieco.2025.4.34

1. INTRODUCTION

Cultural diplomacy has evolved over the last decades into a fundamental. instrument of international relations, complementing traditional political and economic diplomacy. It is increasingly recognised as a strategic mechanism for building trust, fostering long-term cooperation, and encouraging dialogue between communities that may otherwise remain divided by historical, political, or social tensions. Unlike classical diplomacy, which often focuses on negotiations between state actors, cultural diplomacy emphasises people-to-people connections, intercultural understanding, and the promotion of shared values through education, arts, heritage, and knowledge exchange. [9,14,15,19]

The Balkan region provides a particularly compelling case for such initiatives. Historically marked by fragmentation, conflict, and socio-political transitions, the region simultaneously embodies a remarkable richness of cultural traditions, linguistic diversity, and cross-border ties. This paradox—tensions coexisting with shared heritage—renders the Balkans a fertile environment for projects that aspire to transform diversity into a source of strength. In this context, empowering women as leaders and facilitators of dialogue is not merely a matter of equity but a strategic necessity for achieving inclusive growth and sustainable peace. Women leaders often bring distinct perspectives, emphasising consensus-building, community engagement, and long-term collaboration —critical elements in a region still navigating its path toward cohesion. [7,9,14,15,17]

Alongside cultural diplomacy, recent scholarship and policy frameworks highlight the growing importance of science diplomacy as part of the broader diplomatic toolkit. Science diplomacy refers to the use of scientific evidence, technological innovation, and scientific cooperation to advance diplomatic objectives, whether by fostering international collaboration in research (*diplomacy for science*), using science as a vehicle for goodwill and peace-building (*science for diplomacy*), or integrating scientific expertise into policymaking (*science in diplomacy*). The European Union, in particular, has emphasised science diplomacy as a strategic response to global challenges, recognising that disruptive technologies, knowledge sharing, and innovation capacity have become forms of geopolitical power.

It is within this dual framework—cultural diplomacy and science diplomacy—that the present study situates itself. By leveraging artificial intelligence, cybersecurity, and mentorship, the project supported by the RO-SCUD, AOȘR TEAMS IV grant seeks to connect cultural cooperation with technological innovation. The central hypothesis is that digital innovation, if ethically deployed, can serve as a transformative instrument for regional cooperation and inclusion, bridging cultural heritage with scientific and technological progress.

2. RESEARCH OBJECTIVES

The primary goal of the project is to create a secure, AI-driven digital platform entitled *Professional Connections for Women in the Balkans*. This platform is envisioned not simply as a technological tool, but as a "living ecosystem" designed to foster collaboration, knowledge sharing, and empowerment across national borders. At its core, the initiative leverages artificial intelligence to respond dynamically to user needs, while ensuring trust and inclusiveness through strong cybersecurity foundations. One of its most innovative features is the integration of a conversational chatbot module, which acts as both a guide and a facilitator. By analyzing user profiles, preferences, and expressed interests, the chatbot is able to generate tailored recommendations for resources, professional opportunities, events, and potential collaborators, thereby transforming the user experience from passive participation into active engagement. [2,3,5,6]

Beyond this central vision, the project is structured around three interrelated objectives that reinforce one another to maximise impact:

1. Increasing access to personalised cultural and professional resources
   The first objective focuses on providing each user with relevant and timely information that supports both cultural growth and professional development. Through AI-driven profiling, the platform can identify individual needs and suggest resources—ranging from academic publications and cultural initiatives to training programs and networking opportunities. This ensures that users are not overwhelmed by generic information, but instead benefit from carefully curated content that respects their unique trajectories.
2. Optimising the organisation of cultural and scientific events
   A second major objective is to enhance the quality and relevance of events hosted within the Balkan region. By collecting and analyzing data on attendance patterns, user feedback, and engagement metrics, the platform is capable of tailoring future events to better meet community expectations. This data-driven approach facilitates the organization of interactive conferences, workshops, and seminars, ensuring that participants find both personal and professional value in these encounters. In turn, cultural diplomacy is strengthened by meaningful exchanges that resonate with participants' needs and interests.
3. Implementing AI-assisted mentorship to strengthen female leadership
   Finally, the project seeks to address one of the most pressing needs in the region: the development of sustainable mentorship structures that nurture women's leadership. By employing AI to match mentors and mentees based on competencies, career aspirations, and shared goals, the platform promotes authentic and productive relationships. These mentorship connections are expected to accelerate professional growth, enhance confidence, and create a ripple effect in which women leaders mentor the next generation, reinforcing a cycle of empowerment.

Taken together, these objectives are not isolated ambitions but rather interconnected pillars of a broader strategy. By aligning resource accessibility, event optimisation, and mentorship within a single unified framework, the platform positions itself as an innovative vehicle for cultural diplomacy. It has the potential to transform the Balkan region into a collaborative space where women are equipped not only to participate but to lead, shaping a more inclusive and resilient regional identity.

Table 1. Objectives of the project and expected results

Objective	Expected Result
Increase access to personalized cultural and professional resources	Users receive targeted recommendations based on preferences and needs
Optimize the organization of cultural and scientific events	AI-driven analysis ensures events match participant interests
Implement AI-assisted mentorship	Experienced professionals are matched with mentees to support leadership development

3. CYBERSECURITY AND ETHICAL CONSIDERATIONS

The conceptual foundation of this project rests on the conviction that technological innovation must be guided by a clear social mission and ethical responsibility. The future mentoring platform *Professional Connections for Women in the Balkans* is therefore conceived not as a neutral technological product, but as a purposeful and value-driven intervention situated at the intersection of cultural diplomacy, science diplomacy, and gender equity. Its design and methodology integrate principles from computer science, the social sciences, and international relations, ensuring that the technological framework remains firmly aligned with human-centred goals and the broader ambition of social inclusion. [1,8,11,13]

At the technical level, the platform is structured around a modular architecture, which ensures both flexibility and scalability. The choice of modularity is deliberate: in a region as heterogeneous as the Balkans, where digital readiness, infrastructure, and institutional capacity vary significantly, adaptability becomes a precondition for success. A modular system allows the platform to evolve organically, accommodating diverse national contexts while maintaining conceptual and functional coherence.

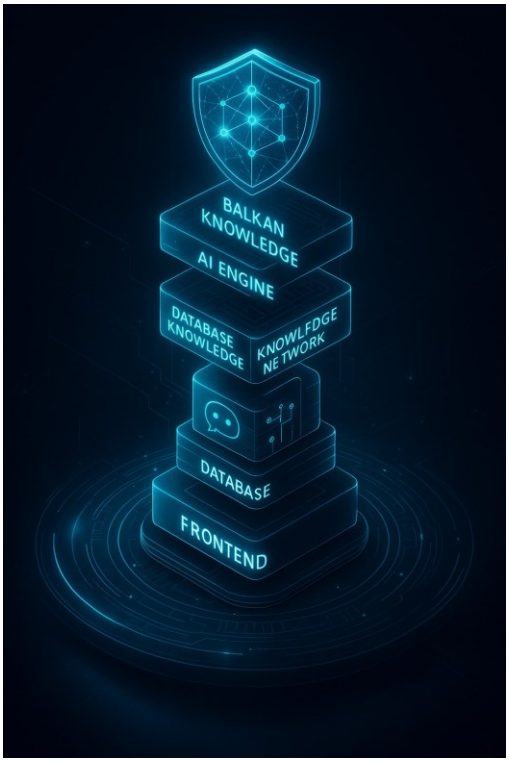

Figure 1 - AI-powered platform tentative architecture

(Source: generated by authors)

The architecture is composed of three interconnected layers:

1. **The user interface layer**, where individuals interact with the platform through personalized profiles, cultural events, and mentorship modules. This is the most visible and socially expressive dimension of the system, designed with accessibility, inclusiveness, and user-friendliness in mind. Its goal is to foster a sense of belonging and to make participation intuitive for users of different professional and linguistic backgrounds.
2. **The artificial intelligence layer**, which forms the analytical core of the platform. Within this layer, machine-learning models are used to generate personalized recommendations, identify meaningful professional connections, and support the organization of events and mentorship activities. Frameworks such as *scikit-learn*, *TensorFlow*, and *PyTorch* enable the creation of adaptive algorithms capable of learning from user feedback while maintaining fairness, transparency, and accountability.
3. **The data management and security layer**, responsible for storing, encrypting, and protecting user information. This layer guarantees compliance with European data-protection standards such as the General Data Protection Regulation (GDPR) and incorporates ethical safeguards that promote privacy, transparency, and integrity in every process of data collection and analysis.

From a methodological standpoint, the project plans to adopt a user-centred and iterative design process**.** This approach ensures that end-users—women leaders, professionals, and cultural actors from across the Balkan region—are not passive recipients of technology but active contributors to its development. Instead of imposing a pre-defined model, the methodology privileges *co-creation*, meaning that user feedback, cultural insights, and experiential knowledge continuously inform each stage of conceptualization and refinement.

The process unfolds across several sequential and interrelated phases:

- **Needs assessment:** Surveys, focus groups, and interviews are conducted to capture the expectations, challenges, and professional realities faced by women in the region. This

phase establishes an evidence-based understanding of users' contexts and aspirations.

- **Prototype development:** The initial modules—user profiles, the recommendation engine, and the conversational chatbot—are designed and tested in controlled environments to evaluate usability and functionality.
- **Pilot testing:** Small, cross-border user groups from multiple Balkan countries participate in pilot sessions to assess cultural adaptability, inclusiveness, and cross-regional relevance.
- **Iterative refinement:** Feedback from pilot testing is systematically analyzed and translated into improvements in technical performance, interface design, accessibility, and security. This cyclical process ensures responsiveness and continuous improvement.
- **Regional scaling:** In the final stage, the platform expands to reach a critical mass of users. Partnerships with academic institutions, cultural organizations, and policy actors will support scaling efforts and help embed the platform into existing regional innovation ecosystems.
- **Project sustainability:** Long-term sustainability will rely on institutional partnerships, capacity-building, and continuous knowledge exchange, ensuring that the platform remains relevant, resilient, and self-renewing over time.

This methodological framework acknowledges that technology alone cannot resolve deeply rooted social and cultural challenges. Rather, it positions artificial intelligence and digital innovation as facilitators of human connection, amplifying existing cultural ties and enabling new networks of trust, collaboration, and leadership. The ultimate aim is to build a sustainable *digital ecosystem* where technological efficiency and human agency reinforce each other—an ecosystem that is as inclusive and adaptable as the communities it seeks to serve.

In addition, the project aligns with the broader principles of science diplomacy, recognizing that technological collaboration and shared research capacities have become central to fostering international understanding and peace. By connecting cultural and scientific dimensions, the initiative contributes to the European vision of diplomacy through knowledge, innovation, and responsible technology. The platform thus serves as both a digital experiment and a diplomatic instrument—one that redefines the way technology, culture, and science intersect to strengthen cooperation, equity, and mutual trust across the Balkan region.

4. EXPECTED RESULTS

The integration of artificial intelligence into the field of cultural diplomacy presents an interesting paradox. On the one hand, AI technologies have the potential to dramatically enhance the personalisation, efficiency, and reach of cultural initiatives. They can connect individuals across borders, tailor recommendations to unique professional needs, and provide scalable mentorship structures that would be impossible through traditional methods alone. On the other hand, the same technologies carry risks and limitations, particularly in regions such as the Balkans, where digital infrastructures and access to technology remain uneven. [18,20,21,22]

One of the key opportunities lies in the ability of AI to amplify voices that are often marginalised**.** By curating resources and mentorship opportunities specifically tailored to women in leadership roles, the platform addresses gaps that conventional institutions have struggled to close. In doing so, it not only empowers individuals but also strengthens the collective agency of women leaders across the region. This opportunity is particularly meaningful in cultural diplomacy, where the credibility and authenticity of voices matter as much as institutional power. [10,12,20]

Another promising aspect is the potential for data-driven event organization and cross-border collaboration**.** Traditional cultural and scientific events often struggle to align with the interests and expectations of participants, leading to inefficiencies and limited impact. By analyzing feedback and engagement patterns, the platform can ensure that events are more interactive, relevant, and inclusive. This data-driven approach strengthens the practical dimensions of cultural diplomacy, transforming it from a symbolic activity into a measurable driver of regional cooperation. [22,23]

Nevertheless, several challenges must be acknowledged. A first concern is the digital divide within the Balkan region. While some countries have advanced digital ecosystems, others still face infrastructural barriers and unequal access to technology. Without careful attention, the platform risks deepening existing inequalities rather than

alleviating them. To mitigate this, strategies such as multilingual interfaces, mobile-friendly design, and outreach to underrepresented communities will be necessary.

A second challenge concerns the ethics of artificial intelligence**.** Although the platform is guided by principles of fairness, transparency, and accountability, there remains a risk that algorithmic decisions could inadvertently reinforce biases—for instance, by privileging users with more digital literacy or access to resources. Continuous monitoring, bias detection mechanisms, and active user feedback will therefore be critical to maintaining trust.

The third challenge relates to sustainability. Many digital initiatives fail not because of weak technical design but because of insufficient long-term support. For this project to succeed, it must secure partnerships with academic institutions, governmental bodies, cultural organisations, and international donors. These partnerships will provide not only financial stability but also legitimacy, embedding the platform within the broader ecosystem of cultural and diplomatic initiatives.

Finally, there is a broader philosophical question: Can digital platforms truly foster trust and dialogue, or do they risk reducing complex intercultural interactions to transactional exchanges? While AI can facilitate introductions and provide structure, the essence of cultural diplomacy lies in authentic human relationships. For this reason, the platform must remain a facilitator rather than a substitute for human agency. Its success will depend not only on technical excellence but also on its ability to preserve and amplify the human dimension of dialogue, mentorship, and cooperation. [20,21,22,23]

In sum, the discussion highlights a dual reality. The opportunities offered by AI-driven cultural diplomacy are significant, with the potential to empower women leaders, strengthen regional cooperation, and scale cultural initiatives in unprecedented ways. Yet the challenges—ranging from digital inequalities to ethical risks—cannot be ignored. Addressing them requires a careful balance of innovation and responsibility, technology and humanity. Only through such a balance can the platform achieve its ambition of transforming cultural diplomacy in the Balkans into a sustainable and inclusive practice.

5. CONCLUSIONS

This paper argues that digital innovation, and particularly artificial intelligence, can play a transformative role in advancing cultural diplomacy and women's leadership in the Balkan region. By conceptualising and developing the *Professional Connections for Women in the Balkans* platform, the project will demonstrate how technology can be aligned with social goals to create spaces of trust, collaboration, and empowerment.

The platform's design—anchored in modular AI architectures, resilient cybersecurity measures, and mentorship structures—represents more than a technical achievement. It embodies a new model of cultural diplomacy, one that is inclusive, participatory, and future-oriented**.** Through its ability to provide personalised recommendations, to optimise the organisation of cultural and scientific events, and to establish mentorship networks, the platform positions itself as both an instrument of professional development and a facilitator of intercultural dialogue.

The conclusions of this research highlight three main contributions. First, the project demonstrates that digital tools can be successfully adapted to the specific needs and complexities of the Balkan region, provided that they are developed through participatory and user-centred methods. Second, it illustrates the critical role of cybersecurity and ethical frameworks in building trust and ensuring that digital platforms serve as enablers rather than barriers to inclusion. Third, it shows that AI-driven mentorship has the potential to break cycles of exclusion by supporting women leaders who, in turn, mentor others, thus creating a sustainable chain of empowerment.

At the same time, the study emphasizes that technology is not a panacea. The platform's impact will depend on its capacity to remain flexible, to address digital inequalities, and to secure long-term institutional support. Cultural diplomacy is, at its core, a deeply human practice, rooted in empathy, dialogue, and mutual respect. Digital innovation can enhance these qualities, but it cannot replace them. The platform must therefore be seen not as an end in itself, but as a bridge between human aspirations and technological possibilities**.**

Looking forward, the project offers a valuable model for how regions with complex histories and diverse identities can harness technology for social good. If

successfully implemented, the platform could serve as a blueprint for other areas facing similar challenges, demonstrating that artificial intelligence, when responsibly deployed, can strengthen diplomacy, foster inclusion, and contribute to building a more interconnected and resilient world.

6. ACKNOWLEDGEMENTS

This work was supported by the grant RO-SCUD, AOȘR TEAMS IV, Grant number 447/15.03.2025, Edition 2025-2026.

The authors also acknowledge the valuable feedback received during the unpublished presentation at the academic conference.

7. REFERENCES

[1] Anghel, M., Cîrnu, C.-E., *e-Government and e-Services portals*, Revista Română de Informatică și Automatică, ISSN 1220-1758, vol. 23(1), pp. 31-36, (2013);

[2] Barbu, M., Vevera, AV., Barbu, DC., *Standardization and Interoperability—Key Elements of Digital Transformation.* In: Cioca, LI., Ivascu, L., Filip, F.G., Doina, B. (eds) Digital Transformation. Intelligent Systems Reference Library, vol 253. Springer, Cham., 2024, https://doi.org/10.1007/978-3-031-55952-5_5.

[3] Barbu, M., Zamfiroiu, A., Marinescu, I.A., Iordache, D., Bumbac, R., *Empowering Digital Education: Understanding Students' Perceptions about Risks and Threats in the Shifting Educational Paradigm*, Studies in Informatics and Control, ISSN 1220-1766, vol. 32(4), pp. 105-114, 2023;

[4] Banciu, D., *Culture de l'information et systems de communication au debut de XXI-e* , Recueil de textes par…, ARS DOCENDI, 2000, ISBN 973-8081-09-2;

[5] Banciu, D., Vevera, A.V., & Popa, I., *Digital transformation impact on organization management and several necessary protective actions*, Studies in Informatics and Control, 32(1), 49–56, 2023.

[6] Choudhary, P., Izhaan A., Kaif, R., , Khushi, S., Kinjal, S., Mahi, B., Purvi, B., *Enhancing Mentorship through Technology: A Comprehensive Review of Current Practices and Future Directions*. International Journal of Multidisciplinary Research and Growth Evaluation. 5. 634-645, 2025;

[7] Đurčević Cucić, M., *European Union's Practice Turn In "Green" Policies in The Western Balkans Accession Negotiations*, SCIENCE International Journal, 3(4), 181-186, 2025, https://doi.org/10.35120/.

[8] Dușescu, R.-A., Apostol, M., Barbu, M., *Chatbot experimental pentru transformare digitală accelerată în instituțiile publice*, Revista Română de Informatică și Automatică, ISSN 1220-1758, vol. 34(3), pp. 105-116, 2024. https://doi.org/10.33436/v34i3y202408.

[9] Grincheva, N., *The past and future of cultural diplomacy*, International Journal of Cultural Policy, 30(2), 172–191, 2023, https://doi.org/10.1080/10286632.2023.2183949.

[10] Hanna, M G., Pantanowitz, L., Jackson, B., Palmer, O., Visweswaran, S., Pantanowitz, J., Deebajah, M., Rashidi, H. H., *Ethical and Bias Considerations in Artificial Intelligence/Machine Learning*, Modern Pathology, Volume 38, Issue 3, 2025, 100686, ISSN 0893-3952, https://doi.org/10.1016/j.modpat.2024.100686.

[11] Iftimoaei, C., Adrian-Victor Vevera, A.V., *Enabling digital education: from official statistics to public policy*, International Conference on Virtual Learning, ISSN 2971-9291, ISSN-L 1844-8933, vol. 19, pp. 247-262, 2024. https://doi.org/10.58503/icvl-v19y202421

[12] Independent High-Level Expert Group on Artificial Intelligence set up by the European Commission, *Ethics guidelines for trustworthy AI*, available at: https://digital-strategy.ec.europa.eu/en/library/ethics-guidelines-trustworthy-ai, (2019);

[13] Iordache, D.-D., Barbu, M., *Analiza comparativă a trei platforme de e-Learning utilizate de către studenți în perioada pandemiei de COVID-19*, Revista Română de Informatică și Automatică, ISSN 1220-1758, vol. 31(4), pp. 55-66, (2021), https://doi.org/10.33436/v31i4y202105;

[14] Li, X. E., 2018, *The Rise and Fall of Soft Power*, Foreign Policy, 20th August 2018. Online, Available at: https://foreignpolicy.com/2018/08/20/the-rise-and-fall-of-soft-power/;

[15] Maftei, J., Popa, A., *Cultural Diplomacy in the 21st Century in the European Context*, Annals of the University Dunarea de Jos of Galati, 2020, 19. 183-194. 10.35219/history.2020.10.

[16] Mutiarin, D., Manaf, H.A., Salam Man, M.N., Kasiwi, A.N., Nurjanah, A., *Analysis of E-mentoring Platform for Future Leaders' Development: A Comprehensive Literature,* E3S Web Conf., 440 (2023) 03021, DOI: https://doi.org/10.1051/e3sconf/202344003021;

[17] Nizamettin, D., *A Cultural Perspectıve to Leadership Practices in Balkans*, Academicus International Scientific Journal, 2021, 23. 110-136. 10.7336/academicus.2021.23.07.

[18] Nunan, J., Ebrahim, A., Stander, M., *Mentoring in the workplace: Exploring the experiences of mentor–mentee relations*, SA Journal of Industrial Psychology, 49, 2023, 10.4102/sajip.v49i0.2067.

[19] Petcu, I., Barbu, D.-C., Anghel, M., Radu, A.F., Golea, D.G., *Shaping the future: between opportunities and challenges of the ongoing 4th and the forthcoming 5th industrial revolution,* Proceedings of the e-*Learning & Software for Education Conference - eLSE*, Vol. 3, p.91, (2020), DOI: 10.12753/2066-026X-20-181;

[20] Radanliev, P., *AI Ethics: Integrating Transparency, Fairness, and Privacy in AI Development*. Applied Artificial Intelligence, 39(1), 2025, https://doi.org/10.1080/08839514.2025.2463722;

[21] Sambucci, L., Elena-Anca Paraschiv, E.-A., *Integrarea accelerată a sistemelor de inteligență artificială și potențialul acesteia de a amplifica vulnerabilitatea infrastructurilor critice*, Revista Română de Informatică și Automatică, ISSN 1220-1758, vol. 34(3), pp. 131-148, 2024. https://doi.org/10.33436/v34i3y202410.

[22] Toreid, H. E., Mosseng Sjølie, B.H., Bjørbæk, S.A., Marcel Köhler, M., *Digital peer mentoring in higher education: Results from a qualitative study involving digital part-time nursing students*, Heliyon, Volume 11, Issue 4, 2025, e42454, ISSN 2405-8440, https://doi.org/10.1016/j.heliyon.2025.e42454.

[23] Wang, J., Shibayama, S., *Mentorship and creativity: Effects of mentor creativity and mentoring style*, Research Policy, Volume 51, Issue 3, 2022, 104451, ISSN 0048-7333, https://doi.org/10.1016/j.respol.2021.104451..